Geospace Science Update

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Geospace Section Head

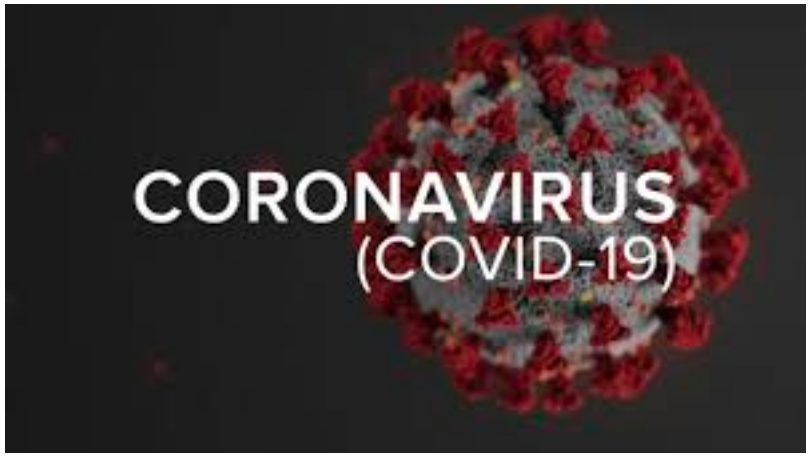
NSF AGS

Outline

- Section Update
  - Staffing
- FY19 Quick Review
  - Program budgets
  - Science Highlights
- FY20 Activities
  - Budgets
  - SWQU
  - PRF
  - SWIFT
  - AAG
- Decadal Mid-term

NSF and COVID-19

- NSF remains open for business
  - Staff are utilizing telework options to practice social distancing and comply with stay-at-home orders



  - Travel is restricted to essential for preserving life and property through April 30
  - Panels and other meetings are using web conferencing technologies
  - New proposals are welcome!!
- Important Notice No 146 has information about NSF implementation of OMB guidance on administrative relief for COVID-19 impacts
  - Google NSF Coronavirus for website with update info

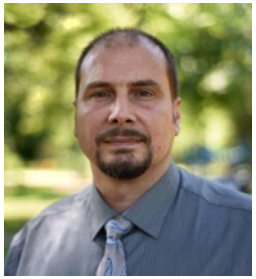
AGS and the Geospace Section

AGS Division Director
Anjuli Bamzai

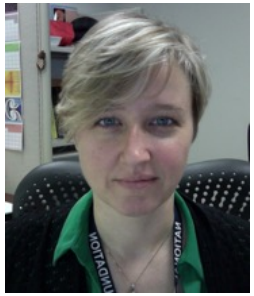
Section Head
Michael Wiltberger

Aeronomy
Alan Liu

Magnetosphere
Lisa Winter



Solar Terrestrial Research
Ilia Roussev



Geospace Facilities
Carrie Black

Mangala Sharma
Space Weather

Expert
John Meriwether

Quick Facts about FY19

- Overall spending in section was $50.9M up 1% from FY18
  - Reflects a leveling off in budget after several positive years

  - SWR funded 4 CubeSats reflecting payback of “loans” made to it in FY18
- Additional facts about AER, MAG, STR, SWR grants in 2019
  - 116 new award actions
  - Over 65% new awards made as standard grants
  - Section mortgage rate is under control

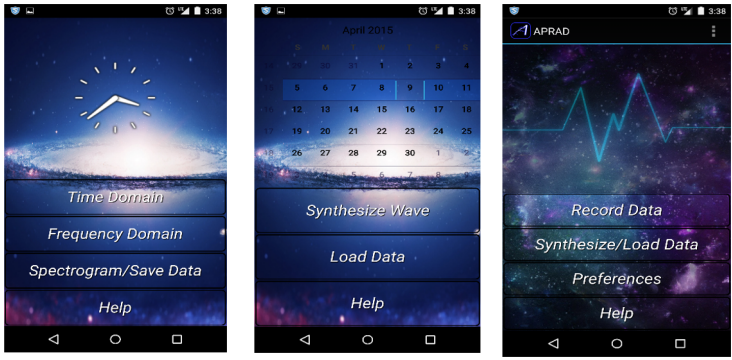
Golkowski CAREER Award Highlights

Whistler Mode Wave Propagation, Amplification, and Coupling

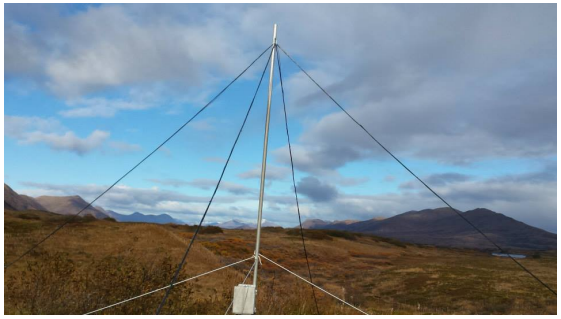
Associate Professor Mark Golkowski
Dept. of Electrical Engineering

- Assessed conditions for nonlinear whistler mode wave growth from ground observations
- Quantified effect of finite temperature for background plasma in numerical raytracing
- Deployed ELF/VLF receiver at K-12 school in Alaska for ground observations
- Developed *APRAD* smartphone app for teaching and outreach (https://www.youtube.com/watch?v=v-QLJyOczUM)

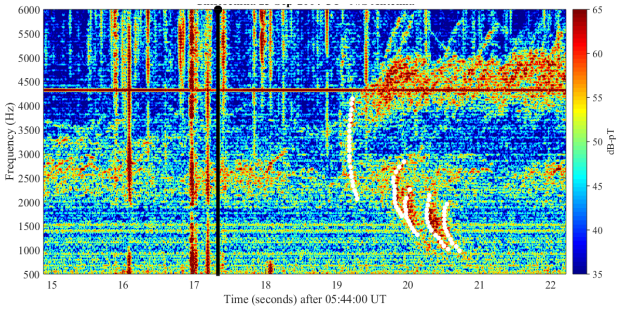
Autonomous Portable Receiver and Display (APRAD)



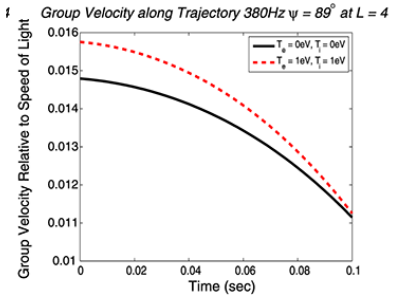
Screen shots APRAD, allows for the recording, synthesizing, and displaying of low frequency electromagnetic and audio signals.



ELF/VLF Receiver deployed at Akhiok, Alaska



Whistler Triggered Chorus
[*Hosseini, Golkowski*, Harid *GRL*, 2019]



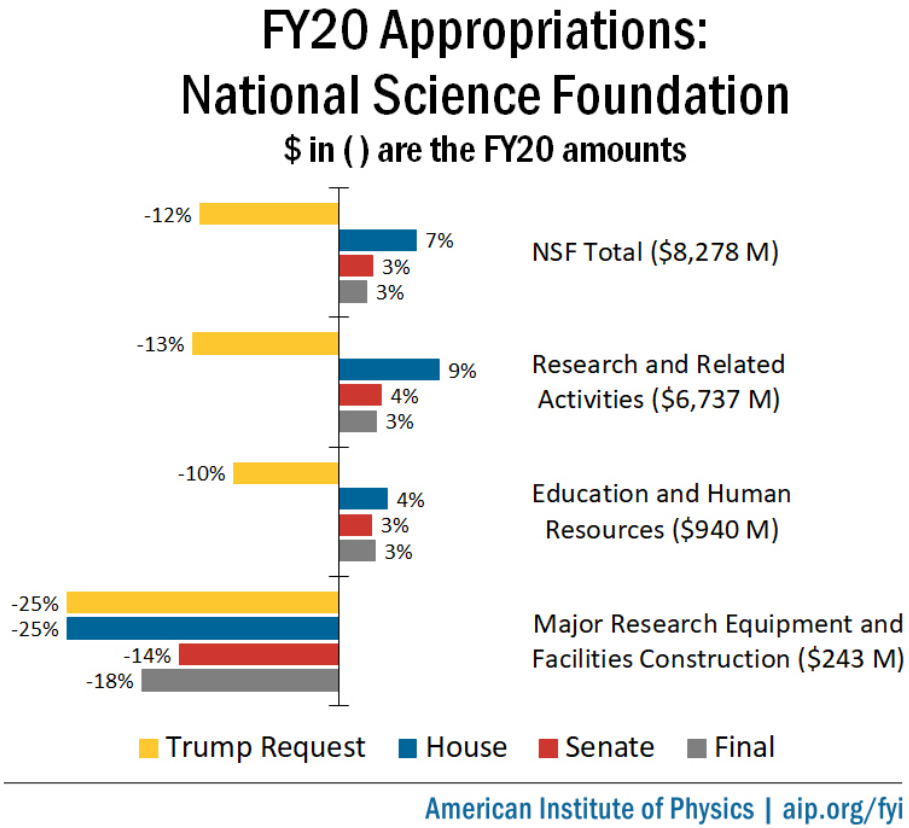
Finite Temperature Raytracing
[*Maxworth & Golkowski*, *JGR*, 2017]

AGS 1254365

Faculty Development in Space Sciences

NSF and AGS Budgets

- FY20 budget was approved on Dec 20
  - NSF budget is up 3% overall
  - MREFC change is fluctuation driven by project timing
- Final levels at the Directorate and Division level have not yet been determined
  - We are expecting a small increase in fund levels within the Section



AGS Postdoctoral Research Fellowships

- After a hiatus the AGS-PRF program has returned to support highly qualified early career investigators independent research efforts

- Solicitation Information
  - Provides two years of support
    - 94K in year 1 and 96K in year 2
  - Award made directly to PI, but need to identify a host institution
  - Graduate student or less than 2 years since PhD to apply
  - No deadlines
  - Google NSF AGS PRF for more information

Space Weather Modeling with Quantified Uncertainties

- NSF and NASA partnership focused on development of next-generation space weather models

- Solicitation Information
  - Proposals must address one or more of the following
    - Assimilation of diverse and distributed observational data
    - Evaluation and propagation of uncertainties in PDE solutions
    - Multi-physics/scale modeling of space plasmas with uncertainty quantification
  - Strongly encourage to include early-career participation in central roles
  - 3 year projects with budgets between $1.5-3.0M
  - Proposals due March 27, 2020
  - Google NSF SWQU for more information

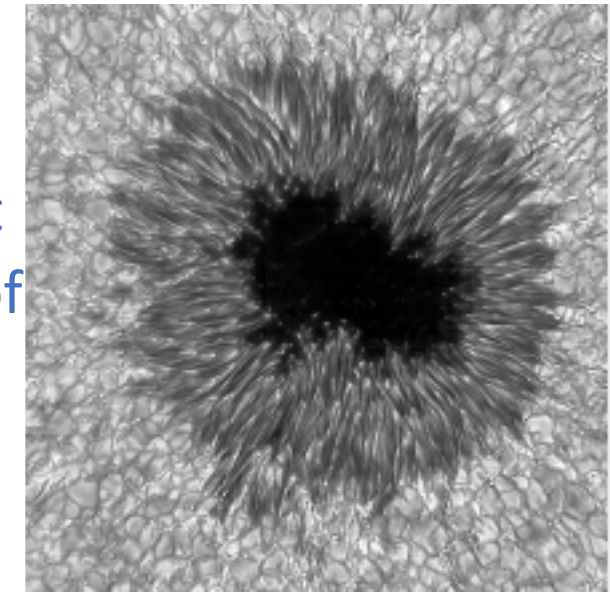
Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT)

- ENG, CISE, and GEO Directorates are supporting an effort focusing on effective spectrum utilization and/or coexistence techniques

- Solicitation Information
  - Proposals must address one or more of the following
    - Innovative Transmitter and Receiver Technologies through Cross-Layer Design
    - Secured and/or verifiable spectrum use through RF/Analog/Mixed-Signal Techniques
    - Low-Cost, Versatile Wireless Technologies
  - 3-year projects with $500K or $1.5M limits
  - Proposals due April 10, 2020
  - Google NSF SWIFT for more information

Astronomy and Astrophysics Grants

Solar Grants through AAG



- Proposals can be for observation, modeling, or instrument development
- Must be relevant to the astrophysics of the Sun, not space weather or the heliosphere

Solicitation Information

- Under solicitation NSF 18-575
- Can support investigations using DKIST observations
- Typically three years of support
- Senior personnel are funded for no more than two months/year
- Deadline: November 15
- Google NSF AAG for more information

Decadal Survey Mid-term Assessment

- Recommendation 3.1 - NASA & NSF continue DRIVE framework
  - Agreed and we are using Geospace PR as an implementation path

- Recommendation 3.2 - Take advantage of emerging opportunities
  - DKIST is coming online soon – AAG grants are a pathway for community utilization
  - HDR and other initiatives are pathways for exploiting data science
  - Ongoing discussions with NASA for improving collaboration

Decadal Survey Mid-term Assessment

- Recommendation 4.1 - R2O2R Roadmap
  - Through SWORM WG working on pathways for improving this essential pipeline

- Recommendation 5.1 - Improve Diversity and Inclusion
  - Discussions with NASA and NAS for supporting state of profession survey
- Recommendation 6.1 – Planning for the next decadal
  - Working closely with NASA to support planning workshops
  - ISR Futures workshop is an early example of NSF support for similar efforts

Decadal Survey Mid-term Assessment

- Recommendation 6.2 - Integrated statement of task
  - NASA, NOAA and NSF have agreed in principle to jointly support next decadal

- Inclusion of evaluation of recommendations for mid-scale research projects under consideration

Thank you – Questions?

- Happy to provide answers ☺